AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. [Currently Amended] A method of measuring polarization dependent loss/gain (PDL) in an optical communications system including a plurality of optical components, the method comprising:

receiving an optical signal at a selected detection point of the optical communications system, the optical signal having been launched into the optical communications system with a predetermined initial polarization state;

detecting a polarization state of the signal; and

evaluating the PDL using the predetermined initial polarization state and the detected polarization state~~.~~;

wherein the step of evaluating the PDL comprises calculating a correlation between the initial polarization state and the detected polarization state.

2. [Previously Cancelled]

3. [Original] A method as claimed in claim 1, wherein the optical signal comprises any one of: a data signal; a test signal; and an Amplified Spontaneous Emission (ASE) signal.

4. [Original] A method as claimed in claim 1, wherein the predetermined initial polarization state is substantially time-invariant.

5. [Original] A method as claimed in claim 4, wherein the predetermined initial polarization state comprises a degree of polarization of the optical signal launched into the optical transmission system.

6. [Original] A method as claimed in claim 5, wherein the step of detecting the polarization state of the signal comprises a step of detecting a degree of polarization of the optical signal at the detection point.

7. [Original] A method as claimed in claim 6, wherein the step of detecting the degree of polarization of the optical signal comprises steps of:

splitting the optical signal into orthogonally polarized light beams;

detecting a respective power level of each of the orthogonally polarized light beams; and

evaluating the degree of polarization from the detected power levels.

8. [Original] A method as claimed in claim 4, wherein the predetermined initial polarization state comprises respective known initial power levels of orthogonally polarized signal components multiplexed into the optical signal.

9. [Original] A method as claimed in claim 8, wherein the step of detecting the polarization state of the signal comprises a step of detecting respective power levels of each of the orthogonally polarized signal components.

10. [Original] A method as claimed in claim 9, wherein the step of detecting the respective power levels comprises steps of:

de-multiplexing each of the orthogonally polarized signal components from the optical signal;

measuring respective eye openings of each of the de-multiplexed signal components.

11. [Previously Amended] A method as claimed in claim 1, wherein the step of evaluating the PDL comprises a step of calculating a vector difference between the detected polarization state and the initial polarization state.

12. [Original] A method as claimed in claim 1, wherein the predetermined initial polarization state comprises a predetermined variation of a polarization vector of the optical signal.

13. [Original] A method as claimed in claim 12, wherein the predetermined variation of the polarization vector comprises a rotation of the polarization vector in accordance with a predetermined dither pattern.

14. [Original] A method as claimed in claim 13, wherein the predetermined dither pattern comprises either one or both of:

a step-wise rotation of the polarization vector between orthogonal directions; and

a small-scale perturbation of a polarization angle of the polarization vector.

15. [Original] A method as claimed in claim 13, wherein the step of detecting the polarization state of the signal comprises a step of detecting a degree of polarization of the optical signal as a function of time.

16. [Currently Amended] A method as claimed in claim 15, wherein the step of ~~evaluating the PDL comprises a step of~~ calculating a correlation comprises calculating a correlation between the predetermined dither pattern and the detected degree of polarization of the optical signal as a function of time.

17. [Original] A method as claimed in claim 12, wherein the predetermined variation of the polarization vector comprises variation of respective power levels of orthogonally polarized signal components multiplexed into the optical signal, in accordance with respective orthogonal dither patterns.

18. [Currently Amended] A method as claimed in claim 17, wherein the step of ~~calculating~~ evaluating the PDL comprises steps of:

detecting a power level of each of the received light beams as a function of time;

calculating respective correlations between the respective predetermined dither pattern and the detected power levels; and

evaluating the respective PDL as a ratio of the lesser of the calculated correlations to the sum of the calculated correlations.

19. [Currently Amended] A system for measuring a polarization dependent loss/gain (PDL) in an optical communications system including a plurality of cascaded optical components, the system comprising:

a transmitter ~~adapted to launch~~for launching an optical signal having a predetermined initial polarization state into the optical communications system;

a polarization state detector ~~adapted to detect~~ for detecting a polarization state of the signal at a selected detection point; and

a processor ~~adapted to evaluate~~for evaluating the PDL using the predetermined initial polarization state and the detected polarization state~~.~~;

wherein the processor comprises a correlator for calculating a correlation between the initial polarization state and the detected polarization state.

20. [Currently Amended] A system as claimed in claim 19, wherein the transmitter comprises a polarization rotator ~~adapted to~~ for selectively ~~rotate~~ rotating a polarization vector of the optical signal.

21. [Currently Amended] A system as claimed in claim 19, wherein the transmitter comprises a controller ~~adapted to~~for selectively varying respective power levels of orthogonal signal components multiplexed into the optical signal, in accordance with respective orthogonal dither patterns.

22. [Currently Amended] A system as claimed in claim 19, wherein the detector comprises:

a beam splitter ~~adapted to split~~for splitting the optical signal into respective orthogonally polarized beams; and

means for detecting respective power levels of each of the orthogonally polarized beams.

23. [Currently Amended] A system as claimed in claim 19, wherein the detector comprises:

a de-multiplexer ~~adapted to~~for de-multiplexing orthogonally polarized signal components from the optical signal; and

means for detecting respective eye openings of each of the orthogonally polarized signal components.

24. [Currently Amended] A network element for measuring a polarization dependent loss/gain (PDL) in an optical communications system including a plurality of optical components, the network element comprising:

a receiver ~~adapted to receive~~for receiving an optical signal at a selected detection point of the optical communications system, the optical signal having been launched into the optical communications system with a predetermined initial polarization state;

a polarization state detector ~~adapted to detect~~for detecting a polarization state of the signal; and

a processor ~~adapted to evaluate~~ for evaluating the PDL using the predetermined initial polarization state and the detected polarization state~~.~~;

wherein the processor comprises a correlator for calculating a correlation between the initial polarization state and the detected polarization state.

25. [Previously Cancelled]

26. [Original] A network element as claimed in claim 24, wherein the optical signal comprises any one of: a data signal; a test signal; and an Amplified Spontaneous Emission (ASE) signal.

27. [Original] A network element as claimed in claim 24, wherein the predetermined initial polarization state is substantially time-invariant.

28. [Original] A network element as claimed in claim 27, wherein the predetermined initial polarization state comprises a degree of polarization of the optical signal launched into the optical transmission system.

29. [Currently Amended] A network element as claimed in claim 28, wherein the detector comprises:

a beam splitter ~~adapted to split~~for splitting the optical signal into orthogonally polarized light beams;

respective optical detectors ~~adapted to detect~~for detecting a respective power level of each of the orthogonally polarized light beams; and

a comparator ~~adapted to evaluate~~for evaluating the degree of polarization from the detected power levels.

30. [Original] A network element as claimed in claim 27, wherein the predetermined initial polarization state comprises respective known initial power levels of orthogonally polarized signal components multiplexed into the optical signal.

31. [Currently Amended] A network element as claimed in claim 30, wherein the detector comprises:

a de-multiplexer ~~adapted to~~for de-multiplexing each of the orthogonally polarized signal components from the optical signal;

a signal analyzer ~~adapted to measure~~ for measuring respective eye openings of each of the de-multiplexed signal components.

32. [Original] A network element as claimed in claim 24, wherein the predetermined initial polarization state comprises a predetermined variation of a polarization vector of the optical signal.

33. [Original] A network element as claimed in claim 32, wherein the predetermined variation of the polarization vector comprises a rotation of the polarization vector in accordance with a predetermined dither pattern.

34. [Original] A network element as claimed in claim 33, wherein the predetermined dither pattern comprises either one or both of:

a step-wise rotation of the polarization vector between orthogonal directions; and

a small-scale perturbation of a polarization angle of the polarization vector.

35. [Currently Amended] A network element as claimed in claim 33, wherein the detector is ~~adapted~~ operative to detect a degree of polarization of the optical signal as a function of time.

36. [Currently Amended] A network element as claimed in claim 35, wherein the ~~processor~~ correlator is ~~adapted~~ operative to calculate a correlation between the predetermined dither pattern and the detected degree of polarization of the optical signal as a function of time.

37. [Original] A network element as claimed in claim 32, wherein the predetermined variation of the polarization vector comprises variation of respective power levels of orthogonally polarized signal components multiplexed into the optical signal, in accordance with respective orthogonal dither patterns.

38. [Currently Amended] A network element as claimed in claim 37, wherein ~~the processor comprises~~:

~~a~~ the correlator is operative ~~adapted~~ to calculate respective correlations between each of the predetermined orthogonal dither patterns and the detected power level; and

the processor further comprises a calculator ~~adapted~~ operative to evaluate the PDL as a ratio of the lesser of the calculated correlations to the sum of the calculated correlations.